$$((b_1 - a_1)\ b_2 - a_2\ b_1 + a_1\ a_2)\ S\left(f_i^2\ I_{i,j}^2\right)\ S\left(g_i^2\ I_{i,j}^2\right)$$

$$(a_1\ b_2 - a_1\ a_2)\ S\left(g_i^2\ I_{i,j}^2\right)\ S\left(f_i\ I_{i,k}\ f_j\ I_{j,k}\right)$$

$$a_1\ a_2\ S^2\left(g_i\ I_{i,k}\ f_j\ I_{j,k}\right)$$

$$\left(a_1\ a_2\ S\left(f_i\ I_{i,k}\ f_j\ I_{j,k}\right) + (a_2\ b_1 - a_1\ a_2)\ S\left(f_i^2\ I_{i,j}^2\right)\right)\ S\left(g_i\ I_{i,k}\ g_j\ I_{j,k}\right)$$

$$((2\ a_1 - 2\ b_1)\ b_2 + 2\ a_2\ b_1 - 2\ a_1\ a_2)\ S\left(f_i^2\ I_{i,k}^2\ g_j^2\ I_{j,k}^2\right)$$

$$(a_1\ b_2 - a_1\ a_2)\ S\left(g_i^2\ I_{i,l}^2\ f_j\ I_{j,l}\ f_k\ I_{k,l}\right)$$

$$(2\ a_1\ a_2 - 2\ a_2\ b_1)\ S\left(f_i^2\ I_{i,l}^2\ g_j\ I_{j,l}\ g_k\ I_{k,l}\right)$$

$$(a_2\ b_1 - a_1\ a_2)\ S\left(g_i\ I_{i,l}\ f_j^2\ I_{j,l}^2\ g_k\ I_{k,l}\right)$$

$$((b_1 - a_1)\ b_2 - a_2\ b_1 + a_1\ a_2)\ S\left(f_i^2\ I_{i,j}\ I_{i,l}\ g_k^2\ I_{k,j}\ I_{k,l}\right)$$

$$(a_1\ a_2 - a_2\ b_1)\ S\left(g_i\ I_{i,l}\ g_j\ I_{j,l}\ f_k^2\ I_{k,l}^2\right)$$

$$(3\ a_1\ a_2 - 3\ a_1\ b_2)\ S\left(f_i\ I_{i,l}\ f_j\ I_{j,l}\ g_k^2\ I_{k,l}^2\right)$$

$$-2\ a_1\ a_2\ S\left(g_i\ I_{i,ip}\ g_j\ I_{j,ip}\ f_k\ I_{k,ip}\ f_l\ I_{l,ip}\right)$$

$$-a_1\ a_2\ S\left(g_i\ I_{i,ip}\ f_j\ I_{j,ip}\ g_k\ I_{k,ip}\ f_l\ I_{l,ip}\right)$$

$$(a_1\ b_2 - a_1\ a_2)\ S\left(f_i\ I_{i,j}\ g_k^2\ I_{k,ip}\ I_{k,j}\ f_l\ I_{l,ip}\right)$$

$$(a_2\ b_1 - a_1\ a_2)\ S\left(g_i\ I_{i,k}\ f_j^2\ I_{j,ip}\ I_{j,k}\ g_l\ I_{l,ip}\right)$$

$$a_1\ a_2\ S\left(f_i\ I_{i,ip}\ f_j\ I_{j,ip}\ g_k\ I_{k,ip}\ g_l\ I_{l,ip}\right)$$

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